



Upper-plate splay fault earthquakes recorded by uplifted coral microatolls on Ramree Island, the western coast of Myanmar (Burma)

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Myanmar is located at the convergent boundary between the Indian-Australian and the Eurasian plates. Offshore western Myanmar, the Indian-Australian plate subducts northeastward underneath the Burma micro-plate along the northernmost part of the Sunda megathrust. Wide-spread marine terraces with numerous uplifted corals are evident for the active deformation along the coast of western Myanmar. The 1762 Arakan earthquake, the last major seismic event along this plate boundary belt, has been proposed to result from slip on upper-plate splay faults, in addition to rupture of the megathrust. Some previous studies also proposed that the interval between large earthquakes in this area is about 900 years from the ages of the marine terraces, but the seismic activity of upper-plate splay faults remains unclear.

From the ages of multiple steps of uplifted coral microatolls, we have identified several previous earthquake events that are likely produced by the upper-plate splay faults. Near the small village of Leik-Ka-Maw at the northwestern corner of the Ramree Island, western Myanmar, we found three groups of uplifted coral colonies with different elevations on the wave-cut platform. U-Th ages of the corals indicate that the second group of corals was killed by co-seismic uplift during the 1762 earthquake. A lower group of corals suggests that there was at least one event after the 1762 earthquake, probably in 1848 according to Myanmar's recorded history. This event has not been reported previously elsewhere, thus it may represent a minor, local event that occurred entirely on a splay fault. Geomorphic evidence for such a local structure is also present near the central western Ramree coast. Detailed topographic survey revealed that the uplifted marine terrace gets higher oceanward. This deformation pattern is likely produced by an east-dipping reverse fault not too far offshore the coastline there. Since most previous studies focused on megathrust earthquakes, the presence of upper-plate splay fault events suggests that the proposed earthquake recurrence intervals in western Myanmar may be overestimated.